



# ICAO ENGINE nvPM EMISSIONS DATA SHEET

## SUBSONIC ENGINES

ENGINE IDENTIFICATION: GENx-1B70/75/P2 BYPASS RATIO (-): 8.8  
UNIQUE ID NUMBER: 01P17GE209 PRESSURE RATIO  $\pi_{co}$  (-): 44.5  
COMBUSTOR: TAPS  
ENGINE TYPE: TF RATED OUTPUT  $F_{oo}$  (kN): 321.6

### REGULATORY DATA

CHARACTERISTIC VALUES:	$LTO_{mass}/F_{oo}$ (mg/kN)	$LTO_{num}/F_{oo}$ (particles/kN)	NVPM MASS CONCENTRATION ( $\mu\text{g}/\text{m}^3$ )
LTO/ $F_{oo}$ AND MAX nvPM <sub>mass</sub>	8.2	8.51E+13	161
AS % OF CAEP/10 LIMIT	-	-	4.1
AS % OF CAEP/11 LIMIT (InP)	2.4	2.0	
AS % OF CAEP/11 LIMIT (NT)	3.8	3.1	

### MEASURED DATA

MODE	POWER SETTING (% $F_{oo}$ )	TIME minutes	FUEL FLOW kg/s	EMISSIONS INDICES*		NVPM MASS CONCENTRATION PEAK nvPM <sub>mass</sub> ( $\mu\text{g}/\text{m}^3$ )
				EI <sub>mass</sub> (mg/kg)	EI <sub>num</sub> (particles/kg)	
TAKE-OFF	100	0.7	2.507	1.8	7.68E+10	
CLIMB OUT	85	2.2	2.050	1.7	7.83E+10	
APPROACH	30	4.0	0.645	3.6	8.75E+13	
IDLE	7	26.0	0.201	2.3	1.95E+13	
LTO TOTAL (kg, mg, number of particles)			844	1904	1.97E+16	-
NUMBER OF ENGINES				1	1	1
NUMBER OF TESTS				3	3	3
AVERAGE LTO/ $F_{oo}$ VALUES (mg/kN, particles/kN)				5.9	6.12E+13	-
MAX EI VALUES (mg/kg, particles/kg) AND MAX MASS CONC. ( $\mu\text{g}/\text{m}^3$ )				6.9	1.91E+14	125

\* Emissions Indices are corrected for thermophoretic loss and fuel hydrogen content

### DATA FOR EMISSIONS INVENTORIES (ESTIMATIONS FOR ENGINE EXIT PLANE VALUES)

MODE	POWER SETTING (% $F_{oo}$ )	CORRECTED EMISSIONS INDICES	
		EI <sub>mass_SL</sub> (mg/kg)	EI <sub>num_SL</sub> (particles/kg)
TAKE-OFF	100	2.4	1.06E+11
CLIMB OUT	85	2.2	1.08E+11
APPROACH	30	5.0	4.67E+14
IDLE	7	2.8	6.39E+13

### AMBIENT CONDITIONS

	From	To	FUEL	
BAROMETER (kPa)	97.4	98.2	HEAT OF COMBUSTION (MJ/kg)	43.15
TEMPERATURE (K)	289.9	297.9	HYDROGEN CONTENT (%mass)	13.79
HUMIDITY (kg water/kg dry air)	0.0079	0.0127	AROMATICS CONTENT (%vol)	17.7
			NAPHTHALENE CONTENT (%vol)	0.38
			SULPHUR CONTENT (ppm by mass)	12

MANUFACTURER: General Electric Company  
TEST ORGANIZATION: General Electric Company  
TEST LOCATION: PTO, Ohio  
TEST DATES: 05/09/2019-06/09/2019

### REMARKS

1. GE Aviation Report R2018AE129/Rev. 0
2. Engine S/N 598-426
3. EI<sub>mass\_SL</sub> calculated from average EI<sub>mass</sub> and KSL<sub>mass</sub>
4. EI<sub>num\_SL</sub> calculated from average EI<sub>num</sub> and KSL<sub>num</sub>